

## *Health Consultation*

# **Truck Repair Yard Portion of Roderick Timber Property Aberdeen, Grays Harbor, Washington**

July 1, 1999

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**Prepared by  
Washington State Department of Health  
under cooperative agreement with the  
Agency for Toxic Substances and Disease Registry**



## **FOREWORD**

The Washington State Department of Health (DOH) has prepared this health consultation under cooperative agreement with the Agency for Toxic Substances Disease Registry (ATSDR), an agency of the U.S. Public Health Service. The goal of the DOH and ATSDR is to identify and mitigate adverse human health effects resulting from exposure to hazardous substances in the environment. This report was prepared in accordance with methodologies and guidelines developed by ATSDR.

Health Consultations are conducted to better characterize past, current, and potential future human exposures to hazardous substances in the environment and to more thoroughly evaluate existing and potential health effects related to those exposures. Three primary methods are used to collect information during a health consultation: (1) biomedical testing, such as the collection of blood or urine samples, to provide information on current (and sometimes past) exposures to a contaminant, (2) environmental testing, such as the collection of soil, water, air or dust, to help determine possible exposure sources, and (3) exposure-dose reconstruction which utilizes environmental sampling information and computer models to estimate the contaminant levels that people may have been exposed to in the past or may be exposed to in the future.

For additional information or questions regarding DOH, ATSDR or the contents of this health consultation, please call the health advisor who prepared this document:

Public Health Assessor  
Washington State Department of Health  
Office of Environmental Health Assessments  
P.O. Box 47846  
Olympia, Washington 98504-7846  
(360) 236-3370  
1-877-485-7316

## LIST OF ACRONYMS

ATSDR	Agency for Toxic Substances and Disease Registry
DOH	Washington State Department of Health
MCL	Maximum Contaminant Level (EPA)
MCLG	Maximum Contaminant Level Goal (EPA)
MDL	Method Detection Limit
MRL	Method Reporting Limit
MTCMA	Model Toxics control Act (Ecology)
OTS	Office of Toxic Substances (DOH)
ppm	Parts per million
ppb	Parts per billion
RMEG	Reference dose Media Evaluation Guide

## LIST OF DEFINITIONS

**EXPOSURE:** An event that occurs when there is contact at a boundary between a human being and the environment with a contaminant of a specific concentration for an interval of time; the units of exposure are concentration multiplied by time.

**EXPOSURE ROUTES:** Exposure routes are the means by which contaminants enter the human body through ingestion, inhalation, or dermal contact.

**PQL:** Practical Quantitation Limit is the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

**RMEG:** ATSDR's Reference Dose Medica Evaluation Guide. A concentration in air, soil, or water (or other environmental medium), which is derived from EPA's RfD, and below which adverse non-cancer health effects are expected to occur to people. RMEGs account only for chronic exposure. The units for an RMEG can be in any units appropriate for a concentration (e.g., mg/kg, µg/L, ppm. Mg/m<sup>3</sup>).

**CREG:** ATSDR's Cancer Risk Evaluation Guide. A concentration in air, water, or soil (or other environmental media), which is derived from EPA's cancer slope factor and carcinogenic risk of 10E-6 for oral exposure. It is the concentration in an environmental media at which the risk for excess cancer is one in one million for a reasonable maximum exposure.

## **BACKGROUND AND STATEMENT OF ISSUES**

The Washington State Department of Ecology (Ecology) has requested that the Department of Health (DOH) prepare a Health Consultation (HC) for the Roderick Timber Company Property site to evaluate the potential human health risks associated with hazardous materials at this site. The purpose of this report is to better evaluate possible public exposures to heavy metals or total petroleum hydrocarbons.

The Roderick Timber Company Property is located approximately 2 miles southeast of Aberdeen, Washington, and is comprised of two major parcels--a 44 acre parcel known as the Sawmill Tract, and a 293 acre parcel known as the Snell Tract. Portions of the Snell Tract have been used as a landfill for wood waste, dredge spoils and municipal solid waste for the City of Aberdeen (see Figure 1). In addition, a 20-acre portion of the Snell Tract has been used for industrial purposes, including a 3-acre lot for a Truck Repair Yard. The facility is surrounded by a chain link fence and is situated between the solid waste landfill on the southwest side and a residential neighborhood on the north side, known as Junction City. The Chehalis River is west of the site, and the Elliott Slough is to the northeast just beyond Junction City (see Figure 2).

The site topography is relatively flat but slopes to the northwest. There are two groundwater aquifers that flow northwest. The shallow perched system ranges from 8-10 feet below ground surface, and the lower main aquifer is approximately 130 feet. There are no private wells. All residents are on Aberdeen City water, located approximately 25 miles north of town.

Local residents are concerned about potential exposure to toxic substances located in the former truck repair yard. Of particular concern is the potential exposure to heavy metals during grading of the facility and surrounding area.

In 1998, Ecology contracted Olympus Environmental Inc. to perform environmental sampling of the former truck yard area and the adjacent northern property. Sampling included soil, groundwater, tap water, and surface deposits of the exterior on two houses. The sampling was conducted in order to determine the extent of contamination within the former truck repair yard and the northern adjacent property. Soil samples were tested for diesel, heavy oil, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, PCB's, and PAH's. Groundwater samples were tested for benzene, toluene, ethylbenzene, xylenes, gasoline, diesel, heavy oil, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, PCB's, and PAH's

A site visit of the truck repair yard and northern adjacent property was conducted on December 15, 1998. The weather was rainy, typical for this area. Residential yards were partly covered with grass and areas of bare soil. There were areas of stressed vegetation near the ditch running along Stanley Street (Figure 3), and the ditch bottom was caked with an orange crusty material, thought to be iron bacteria and landfill leachate. A swing set was observed near a rental house

near the northwest corner of the site.

## **ENVIRONMENTAL SAMPLING**

Contaminants detected above health comparison values are listed in the Appendix, and discussed below. Highest concentrations are listed for contaminants found in more than one soil station or well. Health comparison values have been developed by ATSDR to evaluate potential health hazards. Contaminants detected at levels below health comparison values are not considered to be a health hazard. Contaminants exceeding their respective health comparison value are not necessarily a health concern, but require further evaluation.

Groundwater and Tap Water: Four contaminants were found in groundwater wells at levels which exceeded health comparison values. Although analysis was performed on groundwater samples collected from area wells, no pathway of exposure exists for area residents since they all use city drinking water. Tap water was not discussed since it is not related to the Roderick Timber Property, but, rather Aberdeen City water or the piping from the public utility. Tap water sample results indicated elevated levels of barium (3,200 ppb), and slightly elevated levels of bromodichloromethane (4.7 ppb), and chloroform (41 ppb). The DOH Division of Drinking Water has been notified of this event.

Exterior Wipe Samples: Wipe samples were taken of two residential homes and analyzed for total chromium. The amount of chromium on the two samples was 3.2 and 31 total milligrams (mg).

Residential Soil: Waste motor oil was detected in samples exceeding concentrations established in Ecology's MTCA Method A Cleanup Level of 200 ppm, based on protection of groundwater. The location was in the ditch running along Stanley Street, between Stanley Street and the site perimeter fence, just north of the main shop building (Figure 3). In addition, there were areas of stressed vegetation near the ditch running along Stanley Street (Figure 3), and the ditch bottom was caked with an orange crusty material, which may be leachate and iron bacteria, usually associated with landfills. Chromium was not detected in residential soil.

Industrial Soil: There were five contaminants found in industrial soil.

Chromium: Chromium was found at 40 ppm near the southeast corner of the main shop building. This is below health based comparison values, and is less than the average statewide soil background concentration for chromium, of 41.8 ppm.

The following contaminants were found at levels above their respective health comparison values:

Benzo(a)pyrene: The maximum level of benzo(a)pyrene found in industrial soil near the northeast side of the storage shed (Figure 3) was 0.12 ppm, which exceeds the Cancer Risk Evaluation Guideline (CREG) of 0.12 ppm.. Benzo(a)pyrene concentrations at this

level are not likely to present a health hazard.

Heavy Oil: The maximum level of heavy oil found in industrial soil near the northeast side of the storage shed (Figure 3) was 12,740 ppm, which exceeds Ecology's MTCA Method A Cleanup level of 200 ppm, based on protection of ground water.

Diesel: The maximum level of diesel found in industrial soil near the northwest side of the storage shed (Figure 3) was 15,200 ppm, in exceedance of its Ecology MTCA Method A Cleanup level of 200 ppm, based on protection of ground water.

Lead: There is currently no comparison value for lead in soil. The maximum concentration of lead, found in industrial soil near the northwest corner of the main shop building, (Figure 3), was 60 ppm. Lead concentrations at this level are not likely to present a health hazard.

## **DISCUSSION**

### Ditch:

Based on the concentration of motor oil and apparent iron bacteria found in the ditch along Stanley Street, there may be a dermal or ingestion pathway for area children. The areas of stressed vegetation near the ditch and the orange crusty material in the ditch bottom may be the result of iron bacteria and landfill leachate from the (up-gradient) landfill on the southeast side of the former truck repair yard.

### Drinking Water:

Since all Junction City residents are on Aberdeen City water, there is not expected to be a completed ingestion exposure pathway from drinking water associated with this site. However, there appears to be a completed ingestion pathway of elevated levels of barium from Aberdeen City Water or the piping leading to the residence.

### Soil:

There is currently no comparison value for lead in soil. The maximum level of lead found in industrial soil was 60 ppm. Lead concentrations at this level are not likely to present a hazard for young children. Lead concentrations would have to approach approximately 1,000 ppm before presenting a hazard for young children.

### Air:

Based on environmental sampling performed thus far, there is not expected to be a completed inhalation exposure pathway as a result of airborne chromium. The amount of chromium on the two wipe samples was 3.2 and 31 total milligrams (mg). This indicates that the home exteriors

are contaminated with chromium; however, whether it is at levels of health concern is inconclusive on that determination alone. Generally, in order to determine whether airborne contamination is at levels of health concern, volumetric air sampling is conducted, with results in units of micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Another way to determine the presence of chromium is to perform soil sampling in residential yards. Chromium was not detected in the northern adjacent properties, and was detected in the former truck repair facility, but only at levels comparable to the average statewide background concentrations.

## **CONCLUSIONS**

- Based on existing environmental data, the Roderick Timber Company Site poses no apparent public health hazard; however, there is incomplete characterization for surface soil, sediment, and surface water of the ditch running along Stanley Street and the ditch near the northwest corner of the site.
- There appears to be elevated levels of barium in tap water, indicating contamination from Aberdeen City Water or piping leading to the residence.
- We have received health questions from area residents in Junction City regarding airborne chromium. Those concerns are summarized and addressed in the discussion section.

## **RECOMMENDATIONS**

- Further characterization of sediment, soil, and surface water in the ditch along Stanley Street and the ditch near the northwest corner of the site should be conducted. Meanwhile, children should be discouraged from playing in these areas.
- Although unrelated to the Former Truck Repair Site, there appears to be a completed ingestion pathway of barium in tap water; hence, there should be follow-up sampling for confirmation.
- Results of future environmental sampling should be provided to DOH for evaluation of potential health impacts.

## **REFERENCES**

1. Sampling Report, Roderick Timber Company Property, Olympus Environmental, Inc., September 24, 1998.
2. Natural Background Soil Metals Concentrations in Washington State, Department of Ecology, October 1994.
3. Roderick Timber Company Site Assessment, PTI Environmental Services, February 1989.
4. Remedial Investigation/Feasibility Study, Roderick Timber company Property, March 1989.
5. Toxicological Profile for Lead, US Public Health Service, ATSDR, April 1993.
6. Environmental Protection Agency. March 8, 1994. Uptake Biokinetic Model for Lead. Version 0.99D
7. Sampling Report from Olympus Environmental, Inc., A. Alderson, December 15, 1998.
8. Ecology Model Toxics Control Act (MTCA) Method A Cleanup Levels, December 1993.
9. Environmental Protection Agency, Uptake Biokinetic Model for Lead, Version 0.99D, March 8, 1994.

## APPENDIX A



Table 1: Groundwater Concentrations (ppb)

Table 2: Industrial Soil (ppm)

Table 3: Residential Soil (ppm)

## APPENDIX A

### Sampling Results for Groundwater and Industrial Soil

TABLE 1  
GROUNDWATER CONCENTRATIONS (ppb)  
(See list of definitions below at beginning of this report)

Contaminant	Groundwater Monitoring Well	Comparison Value	Comparison Value Reference	Laboratory PQL
Arsenic	40	0.02	CREG	
Benzo(a)Pyrene	1.5	0.005	CREG	
Lead	20	5	MTCA Method A	10 (detection limit)
Chromium	510	30	Child RMEG (assume Cr-6)	50 (detection limit)

TABLE 2  
INDUSTRIAL SOIL (ppm)

Contaminant	Industrial Soil	Comparison Value	Comparison Value Reference	Method Detection Limit	Natural Soil Background (statewide)
Benzo(a)Pyrene	0.12	0.1	CREG		
Heavy Oil	12,740	*200	Ecology MTCA Method A Cleanup		
Lead	60			0.5	17.09
Diesel	15,200	*200	Ecology MTCA Method A Cleanup		

\*Surrogate is TPH-diesel

TABLE 3  
RESIDENTIAL SOIL (ppm)

Contaminant	Residential Soil (ditch)	Comparison Value	Comparison Value Reference	Method Detection Limit (PQL)
Motor Oil	1,280	*200	Ecology MTCA Method A Cleanup	66

## APPENDIX B

Figure 1: Area map

Figure 2: Roderick Timber company Site

Figure 3: Site map and Adjacent property